
# Draft Final Proposal on Non-Credit Issues

# Near-term Enhancements to Congestion Revenue Rights (CRR)

## December 10, 2009

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# Near-term Enhancements to Congestion Revenue Rights (CRR)

## 1. Introduction

The Federal Energy Regulatory Commission's (FERC) approval of the February 2006 tariff filing in support of the California ISO's new market design, and several subsequent filings and associated orders, established the policy for Congestion Revenue Rights (CRRs) in the ISO's current market. The ISO has released short-term and long-term CRRs for the start of its new market design through the allocation and auction processes for CRRs that have been in effect since April 1, 2009. The ISO is now conducting both annual and monthly CRR allocation and auction processes for the release of prospective CRRs. This experience provides an opportunity to consider refinements in some details of CRR and related processes.

Through the weekly CRR conference calls with market participants and its own evaluation, the ISO has identified the issues listed below as candidates for further refinements. The ISO issued an Issue Paper in August 2009 on all issues, Straw Proposal and Update to Straw Proposal on CRR-related credit issues in September, Draft Final Proposal on credit issues in November, and Straw Proposal on non-credit issues in November, as key documents in the stakeholder process to address the issues and develop appropriate solutions to them.[1] Stakeholder comments on the ISO's Straw Proposal have supported the ISO's proposals on most issues.[2] For continuity, this Draft Final Proposal retains the explanation of issues and the ISO's proposals, and adds three substantive changes from the Straw Proposal:

1. In the area of revising the process for transferring CRRs when load migrates between between Load Serving Entities (LSEs), this document adds a dispute resolution process.
2. Whereas the Straw Proposal described the calculation and the benefits of using a Weighted Least Squares (WLS) optimization function in the CRR allocation process, the ISO was uncertain about the relative costs and benefits of proceeding with this change. Based on broad stakeholder support for this proposal and initial discussions with the ISO's vendor, the ISO now proposes to implement this change.
3. The ISO summarizes the stakeholder comments received on the Straw Proposal, and adds further explanation of its proposals where needed.

The status of the various issues is as follows:

[1] Two issues that needed early resolution were approved at the July 2009 Board meeting, and filed at FERC: elimination of CRR payment pro-rationing in preliminary settlement statements, and assignment of LMPs for disconnected pricing nodes.

[2] Stakeholder comments are available at http://www.caiso.com/2403/24037c20669e0.html.

**CRR Related Credit Issues**

- CRR credit policy enhancements for participation in CRR auctions: The ISO has published its Draft Final Proposal prior to presentation to the Board of Governors in early 2010.
- Process for re-selling CRRs of a defaulting CRR holder: The ISO will consider the refinement of this process at a future date, along with remaining non-credit issues.
- Re-evaluation of holding credit requirements for extraordinary circumstances: The ISO's business process has been refined through the stakeholder process, and will be incorporated in the Business Practice Manual (BPM) for CRRs through the BPM change management process.

This Draft Final Proposal states the ISO's proposed policy and business practice changes to resolve non-credit issues that can be addressed in the near-term. For context, in this document we repeat the content of issues for which there have been significant comments to resolve from the Straw Proposal, and explain the ISO's response. The non-credit issues are summarized here and detailed further as needed in later sections of this document:

**Non-Credit Policy Issues**

- Revise load migration process: The current process for transferring CRRs due to load migration between LSEs requires the ISO to handle data on retail end-use customers. These data are not otherwise the type of data for which the ISO is responsible for handling and processing. A revised process retain the same methodology the ISO currently uses to determine the load transfers but will avoid requiring the ISO to receive such data on an ongoing basis. In this Draft Final Proposal, the ISO adds details of its proposed dispute resolution process that pertain to the calculation of the load transfers.
- Revise modeling and treatment of trading hubs in CRR allocation: The current CRR allocation process disaggregates a nominated trading hub CRR into separate CRRs for each constituent PNode of the trading hub, resulting in holdings of many small CRRs. A revised approach for allocating and tracking CRRs having a trading hub source or sink will streamline this process.
- Eliminate multi-point CRRs from CRR design: Market participants strongly desire the ability to sell CRRs in the auction, but multi-point CRRs make it difficult to implement the sale of CRRs. Eliminating multi-point CRRs will facilitate the sell function. Having the multi-point function in the CRR system complicates the implementation of almost every new feature that might be desired while offering very little offsetting benefit.
- Weighted least squares objective function: The current CRR allocation software maximizes the release of CRRs by utilizing the most effective nominated CRR, from among the CRR requests, to mitigate congestion in the simultaneous feasibility test. As a result the software does not equitably distribute the reduction from CRR allocation requests among participants. The use of a weighted least squares CRR optimization algorithm would balance equity with maximum CRR release.
- Refinement of tiers in monthly allocation: The current monthly CRR allocation uses two tiers even though the incremental amount of CRRs released after the annual

CRR process is limited. The Issue Paper stated a potential solution to move to a single allocation tier, to make the monthly allocation process more streamlined. Stakeholder comments on the Issue Paper expressed reluctance to accept both the elimination of multi-point CRRs from CRR design and the reduction of the monthly process to a single tier. As a result, the ISO proposes to retain the two-tier monthly allocation process and use a uniform definition of eligibility for CRR requests in both tiers, which the ISO expects will achieve much of the desired streamlining of the monthly allocation process.

**Non-Credit Business Process Issues**

- Sale of CRRs in the CRR auctions: CRRs can only be sold in the auction through a purchase of CRRs that are in the opposite direction of the originally released CRR. Alternatively, a market participant may transact a trade through the Secondary Registration System. Implementation of the sell function in the auction software will simplify these transactions for market participants.
- Modeling approaches to reinforce CRR revenue adequacy: In the initial months of operation of the new ISO markets, the ISO has lacked data regarding the impact of transmission outages on CRR revenue adequacy to accurately determine the optimal amount of monthly CRRs for release. As a result there were significant CRR revenue shortfalls in the CRR balancing account for the first three months. Once the ISO has accumulated sufficient post go-live experience, the ISO will consider ways to improve its modeling of anticipated outages for the monthly CRR release, to better balance the objectives of revenue adequacy and optimum CRR release.
- Tracking of Long Term CRRs in CRR system: The ISO's current process involves manual work-arounds, which will be automated. These processes are internal to the ISO and do not impact either the CRR holdings or the business processes of market participants. The ISO has explained the issues and the proposed process improvements through this stakeholder process, and will proceed to implementation.
- During preparation for the PNP for the 2010 annual CRR process the ISO had issued a technical bulletin to provide clarification of the process for developing "signature data" for the Priority Nomination Process (PNP). The process that was followed is in line with the current Tariff language but some participants felt that additional language should be added to better describe how this process should be done.

This initiative is to develop the principles for business processes that will implement the new or existing policies. Some issues involve software changes, while others are process changes. The principles for business processes will then be documented in the CRR Business Practice Manual, and implemented in Market Operations software and business practices.

## 2. Process and Proposed Timetable

The ISO's stakeholder process began with publication of the Issue Paper on August 14, 2009, and discussion of the Issue Paper in a stakeholder conference call on August 21 for the purpose of identifying in collaboration with stakeholders the priority of the issues and to begin identifying and evaluating alternatives. The ISO continued discussion of the Issue Paper in a stakeholder

meeting on September 8, 2009, then issued its Straw Proposal on November 9 and held a conference call on November 16. The ISO received written comments from stakeholders after these meetings, which the ISO has considered in formulating this Draft Final Proposal. The ISO will hold a stakeholder conference call on December 17 to discuss the issues addressed in this paper.

The schedule for issue identification on all issues, and resolution of CRR-related credit issues, is as follows:[3]

| **Date** | **Activity or milestone** |
|---|---|
| August 14 | Publish Issue Paper |
| August 21 | Stakeholder conference call on CRR-Related Credit Issues in Issue Paper, and preliminary questions on other issues |
| August 28 | Stakeholder comments on Issue Paper |
| September 8 | Stakeholder meeting (or conference call) on CRR-Related Credit Issues Straw Proposal and on Issues Paper for other issues |
| September 15 | Stakeholder comments on CRR-Related Credit Issues Straw Proposal and on Issue Paper for non-credit issues |
| November 9 | Straw Proposal on Non-Credit Issues |
| November 16 | Stakeholder Conference Call on Draft Final Proposal on CRR-Related Credit Issues and on Straw Proposal on Non-Credit Issues |
| November 23 | Stakeholder comments on Straw Proposal |
| December 11 | Draft Final Proposal on Non-Credit Issues |
| December 18 | Stakeholder Conference Call on Draft Final Proposal on Non-Credit Issues |
| Implementation dates will vary depending on policy resolution and software development. | |

## 3. Criteria for Evaluating Potential Solution Approaches

The ISO's proposed resolution of all issues has been developed based on consideration of stakeholder inputs, sound market design, and evaluation of the ISO's ability to implement alternative solutions in a timely manner. The specific factors to be considered are identified separately for each topic area.

[3] Meetings and conference calls concerning credit issues are not included in this table.

# 4. Issues to be Addressed

In the subsections below, this Draft Final Proposal describes the issues that have been addressed concerning policies and business processes associated with CRRs, and the solutions that the ISO believes will resolve the issues. In the discussion below, the ISO includes summaries and analyses of the stakeholder comments that were submitted on the Issue Paper and Straw Proposal. The ISO invites feedback from stakeholders regarding whether the ISO has appropriately identified solutions that resolve the issues that need to be addressed before the ISO presents its recommendations to its Board of Governors.

## 4.1. CRR-Related Credit Issues

As noted above, the Straw Proposal, Update to Straw Proposal, and Draft Final Proposal on CRR-Related Credit Issues were addressed in previous stakeholder meetings. The credit-related issues are not considered further in this document.

## 4.2. Non-Credit Policy Issues

### 4.2.1. Process for adjusting CRR holdings to reflect load migration

The basis for the allocation of CRRs to Load Serving Entities (LSEs) in the annual and monthly CRR allocation processes is the amount of load served by each LSE. Existing ISO policies for CRR allocation are founded on the principle that, fundamentally, CRRs are associated with the end-use customers served by the LSE, and that the LSE acts on behalf of its end-use customers when it requests and is allocated CRRs. Thus, when end-use customers migrate between LSEs (for example, in the retail Direct Access market), the CRRs that were allocated on behalf of the end-use customers are reassigned from the old to the new LSE.

To perform this transfer of CRRs, the ISO currently performs a two-stage process. First, the ISO receives load migration data from each of the utility distribution companies (UDCs). Using these data, the ISO calculates the net load migration between each pair of LSEs. Second, the ISO calculates the appropriate transfers of CRRs between LSEs. The current process is governed by tariff section 36.8.5 and is described in section 7.3 of the business practices manual (BPM) for CRRs.

The current process for transferring CRRs due to load migration between LSEs requires the ISO to handle data on individual retail end-use customers. These data are not otherwise the type of data for which the ISO is responsible for handling and processing, and the current process requires the ISO to develop business processes that do not serve other ISO functions and that expose the ISO to risks in data management that it would not otherwise face. The ISO seeks to develop alternative arrangements that would be consistent with the current methodology as reflected in the ISO tariff and BPM for CRRs but that would not require the ISO to receive and be required to manage such data on an continuous basis.

The ISO will revise the existing process by separating the first part of the process described above into two distinct roles. Currently, the initial step consists of a determination by the ISO of the number of end-use customers in each of several customer classes based on raw data for end-use customers provided by the UDCs to the ISO. . The proposed approach would transfer the task of determining the number of end-use customers in each of several customer classes

by the UDCs using the same methodology the ISO was using for the same purpose. This would eliminate the need to transfer the retail end use customer data by the UDCs, whom instead of providing the raw data would be reporting to the ISO the number of end-use customers in each of the customer classes that have transferred between each pair of LSEs. The ISO does not propose to change the existing calculation of average usage per customer in the customer classes, and does not propose to change the methodology of multiplying the average usage times the number of customers in each customer class that have transferred between LSEs. Based on this information provided by the UDC, the ISO will then calculate, as it does now, the net load migration between each pair of LSEs serving load within each UDC's distribution service territory. The ISO would then proceed to conduct the transfer of the allocated CRRs between LSEs based on the load migration determination as it does now.

The change to the existing process is that instead of submitting the raw data on individual transfers of end-use customers to the ISO, the UDCs will retain the raw data and report the number of customers who have transferred. This is a reduction in the volume of data that the UDCs must provide to the ISO. The ISO is confident that the UDCs are already able to identify the customer class defined by the ISO, for each customer in the UDCs' territories, because this is a necessary step in the existing calculation of average usage per customer in each of the customer classes. The ISO has assisted the UDCs in setting up the existing process, including the provision of prototype computer software that performs the required calculations, and will continue to provide such assistance when it is needed.

Alliance for Retail Markets (AReM) is concerned about an LSE's ability to have confidence in the load migration results if the calculation process is turned over to the UDCs, and asks the ISO to implement specific procedures by which an LSE may dispute a CRR transfer calculation directly with the CAISO. Pacific Gas and Electric (PG&E) does not support the ISO's proposed change because the existing process was developed through a previous stakeholder process, and PG&E does not feel the change has adequate justification. PG&E asks the ISO to review the entire load migration process. Powerex finds the CAISO proposal for adjusting CRR's to reflect load migration to be reasonable, since the CAISO should not have access to individual retail customer information. Southern California Edison (SCE) requests further information on whether the proposal will change modify the existing load migration data templates (and requests a sample design of revised templates including specific data elements), and on responsibility for errors and what type of dispute process the CAISO envisions. San Diego Gas and Electric (SDG&E) favors simplifying the load migration data submittal process by having LSE's report migrating customer by customer class count rather than customer consumption, but comments that time and effort will still be required to change business systems and processes.

Since the ISO proposes to change from receiving individual customer data records to receiving an aggregated count of transferring customers, a change in data format is unavoidable, as is a period of time to modify and test systems for the new process. Defining the data format and other implementation planning will be addressed during the ISO's implementation phase. To address these and any other business process issues, the ISO issued a market notice on December 3 announcing the formation of a Load Migration Work Group. Another critical implementation step will be to obtain agreement on a dispute resolution process. The ISO proposes the following process for purposes of this Draft Final Proposal, and will address any further details during the implementation process:

1. In the existing process (described in section 7.3 of the Business Practice Manual for Congestion Revenue Rights), the ISO receives data from the UDCs by approximately the 20th day of each month, and calculates CRR transfers beginning approximately on the 21st of each month, with an effective on the first of the month for load migration that

is effective by the first of the same month. The ISO proposes to keep the same schedule, but will receive an aggregated count of transferring customers instead of receiving individual customer data records.

2. The aggregated count of transferring customers will be sent on the same schedule to the LSEs who are affected by load transfers. The data received by each LSE will be limited to the count of customers for which it is the load-gaining LSE, and the count of customers for which it is the load-losing LSE. The ISO will establish this data transfer process in the Load Migration Work Group, but ideally the UDCs would provide the same data to the LSEs that the UDCs provide to the ISO. Thus, the LSEs can begin to verify the submitted data on approximately the 20th day of the month. In the current process, LSEs do not directly receive the same data inputs that the ISO uses for its calculations.
3. On approximately the 22nd day of each month, the ISO provides the calculated CRR transfers to the affected LSEs, in both the current and the proposed processes. Under this existing process, it has been necessary for the ISO to remain informed by the LSEs about any disagreements with the results by the 24th of the month so that the ISO could complete processing of monthly CRRs before the new month begins. The ISO proposes to keep the same schedule for receiving any disagreements about the ISO's data. Thus, the proposed process extends the time available for LSEs to review the ISO's data, and to inform the ISO about disagreements, from two days to four days.
4. In the event that an LSE disagrees with the UDC about the aggregated count of customers that the UDC has provided to the ISO, the LSE should contact the UDC and the ISO as quickly as possible during the interim period that falls normally between the 22$^{nd}$ of the month and the 24$^{th}$ so that the ISO can perform its calculations using corrected data if needed. If the LSE and UDC are unable to resolve the LSE's disagreement, the LSE and UDC will submit the dispute to the ISO. During the LSE's and UDC's consultation with the ISO concerning the dispute, the ISO may request the data from the UDC that it now receives, and may request explanations of the disputed data from the LSE and/or UDC. In the event that the ISO needs to review the data that it receives from the UDC through the current process, the ISO will purge the data upon resolution of the dispute so that there is no need for retention of such data beyond what is necessary to resolve the dispute. If the parties cannot resolve the dispute, before the 24$^{th}$ of the month, to the extent feasible the ISO will recalculate the aggregated count of transferring customers and proceed with the subsequent steps based on that calculated amount.
5. In the event that consultation with the ISO, and if available a recalculation of the aggregated count of transferring customers the parties cannot resolve the dispute, just like today, the LSE or UDC may pursue further review through the provisions of Section 13 of the ISO Tariff.

### 4.2.2. Method for handling trading hubs in the CRR release process

Under the ISO's current procedures, participants in CRR allocations and auctions may request sources reflecting Trading Hubs. However, there are limits to the availability of these and other sources for CRR awards in that the available transmission network capacity is limited to 75% of the full capacity, and the full physical network capacity is further reduced by 6% of the MVA (mega-volt-ampere) rating to account for reactive power and transmission losses. In order for CRRs that have Trading Hubs as their source reflect the congestion charges that market

participants would face in the market, the Trading Hubs would need to maintain the same distribution factors among generators that will be used in the Day-Ahead Market. The result of this limitation is that if the requested Trading Hub CRRs were maintained as being sourced at Trading Hubs, a network constraint that limits further awards from a single generator within its Trading Hub would prevent further awards from the Trading Hub as a whole. This can be particularly problematic if a constraint to an individual generator becomes limiting in Tier 1, since no further capacity is then available for awards using Trading Hubs in Tier 2 or Tier 3 of the CRR allocation process.

However, a result that produces a very similar economic value as the Trading Hub can be achieved by converting the Trading Hub's CRR nomination to a portfolio of individual generator nominations, which is the ISO's current practice. The current approach for handling CRR nominations for the allocation process when the CRR source is a trading hub involves unbundling the nominated CRR into multiple, often fractional MW CRRs whose sources are the individual PNodes that comprise the Trading Hub. This approach leads to a proliferation of large quantities of small MW value CRRs, which is both inefficient and burdensome from the perspective of CRR holders and the ISO alike. To explore alternatives to issuing the disaggregated Trading Hub CRRs, the ISO's Issue Paper introduced two alternative solutions (limiting Trading Hub nominations in Tier 1 of the annual CRR allocation, or directly reserving transmission capacity during Tier 1 for allocation in Tier 2), and a stakeholder comment proposed a third alternative that is described below and that appears to avoid the disadvantages of the first two alternatives.

As proposed by PG&E, nominations for Trading Hub CRRs would be treated as follows:

1. All Trading Hub nominations would be disaggregated to their constituent PNodes,
2. The Simultaneous Feasibility Test (SFT) would be conducted such that all the constituent PNodes are awarded in full, and any binding constraints caused by the nominations are mitigated by a counterflow CRR not to exceed the disaggregated CRR MW amount at the corresponding disaggregated PNode,
3. The CRR award would consist of the initial nomination (whose source is the Trading Hub) and the counterflow CRRs specified in the previous item, and
4. The Seasonal Eligible Quantity (SEQ) for subsequent tiers would be reduced by the Trading Hub award minus the counterflow amounts.

PG&E's comment offered the following example:

THX = Trading Hub X consisting of five PNodes when disaggregated

S1 = THX constituent PNode #1 (20% of THX)

S2 = THX constituent PNode #2 (50% of THX)

S3 = THX constituent PNode #3 (15% of THX)

S4 = THX constituent PNode #4 (10% of THX)

S5 = THX constituent PNode #5 (5% of THX)

An LSE nominates a CRR with 100 MW with THX as the source and a DLAP as the sink. Suppose a binding constraint reduces S1 using the current approach. Under the ISO's current methodology, the resulting awards would be:

S1 to DLAP = no award (0 MW)

S2 to DLAP = 50 MW

S3 to DLAP = 15 MW

S4 to DLAP = 10 MW

S5 to DLAP = 5 MW

Total from constituent PNodes to DLAP = 80 MW

That is, currently the ISO would award and track CRRs four CRRs, totaling 80 MW, and reduce the LSE's SEQ for the next tier by 80 MW.

Under PG&E's proposal, the resulting awards would be:

THX to DLAP = 100 MW

DLAP to S1 = 20 MW

Then, the ISO would award and track two CRRs (100 MW from THX to the DLAP, and 20 MW for the counterflow CRR from DLAP to S1), and reduce the LSE's SEQ for the next tier by the net award of 80 MW. PG&E states that its proposal would result in fewer or an equal number of CRR source-sink pairs being awarded unless all the constituent PNodes were partially reduced to a non-zero MW amount due to a binding constraint(s). In that case, one additional source-sink pair would be awarded compared to the current ISO methodology.

As stated by PG&E, the SFT would need to add constraints to ensure that the counterflow CRRs do not exceed the disaggregated constituents of the Trading Hub, which would be a significant change to the ISO's CRR software. The same result can be achieved by processing the Trading Hub CRR nominations as the ISO currently does, noting which constituent PNodes have been subject to disproportionate reductions as S1 has been in PG&E's example, and then (1) awarding a rebundled Trading Hub CRR based on the proportion to which S2 to S5 could be awarded, and (2) calculating the counterflow CRR from DLAP to S1 as the difference between S1's share of the awarded Trading Hub CRR and the amount that the ISO's current methodology would award to S1. Because the ISO's current methodology would not award less than zero MW of CRR to S1, this modified proposal will not award more counterflow CRR from DLAP to S1 than S1's share of the Trading Hub CRR.

The ISO also notes that as proposed by PG&E, the requested CRR would be granted in full under apparently all conditions, even though the intent appears to be to address only disproportionate impacts on only some constituent PNodes within the Trading Hub. However, it is unlikely that all constituent PNodes of a Trading Hub would be subject to binding constraints unless either (1) there is a binding constraint that completely separates the Trading Hub from the DLAP (for example, Path 26 being binding in the SFT between the SP15 Trading Hub and the PG&E DLAP), or (2) there is a binding constraint that prevents CRRs from being awarded in full to the DLAP regardless of which PNode of the Trading Hub would be designated as the source. These are not conditions under which CRR nominations with Trading Hubs as their source should be fully awarded. By processing the Trading Hub CRR as the ISO currently does and then issuing a rebundled Trading Hub CRR as discussed above, the ISO will avoid issuing CRRs that would either (1) violate binding constraints that separate the Trading Hub from the DLAP, or (2) violate binding constraints on flows to constituents of the DLAP.

The process proposed by the ISO, as a modification to PG&E's proposal, is:

1. All Trading Hub nominations would be disaggregated to their constituent PNodes, as in the ISO's current methodology,
2. The SFT would be conducted using the ISO's current methodology, and a rebundled Trading Hub CRR award would be computed as a percentage of the Trading Hub

nomination, using the highest percentage that has been awarded to a constituent PNode relative to the disaggregated nomination in step 1,[4]

3. The CRR award would consist of the rebundled Trading Hub CRR and counterflow CRRs that are needed to relieve any binding constraints that would be caused by awarding the rebundled Trading Hub CRR, which are calculated as the difference between the PNode CRR awards resulting from the ISO's current methodology and the PNodes' shares of the rebundled Trading Hub CRR, and [5]
4. The Seasonal Eligible Quantity (SEQ) for subsequent tiers would be reduced by the rebundled Trading Hub award minus the counterflow amounts.

During the ISO's discussions to date with its vendor concerning implementation of this proposal, a detail surfaced that does not affect its implementation, but that needs to be understood by market participants. That is, when the SFT produces results with fractions of MW of CRRs, the fractions are truncated to 0.001 MW increments. This truncation would affect both the PNode CRR awards resulting from the current methodology and the PNodes' shares of the rebundled Trading Hub CRR, and the calculation of counterflow CRRs would still be the difference between the SFT results and the PNodes' shares of the rebundled Trading Hub CRR, as described in step 3 above. However, effects on a scale of 0.001 MW may be found in the size of the awarded Trading Hub CRRs. Examples of this effect are on slides 21 and 22 of the ISO's presentation for the November 16 stakeholder call, which is available at http://www.caiso.com/2464/2464c5941a230.pdf.

Finally, discussion of PG&E's proposal during a stakeholder conference call prior to the submission of written comments included the awarded Trading Hub CRRs, resulting from an annual CRR allocation, being eligible for renewal in the Priority Nomination Process (PNP) in the following year's annual CRR allocation. This renewal would not apply to the counterflow CRRs. The ISO considers this addition to the proposal to be beneficial to market participants, and includes it as part of this Draft Final Proposal.

SCE and SDG&E support the ISO's proposal. SDG&E requests examples of how Trading Hub and counterflow CRRs would be awarded when binding constraints are present between Trading Hub resources and a LAP sink, and this situation is discussed in slides 20 and 22 of the ISO's presentation for the November 16 stakeholder conference call.[6] Silicon Valley Power (SVP) supports the ISO's proposal in principle, but requests the CAISO to implement several

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[4] The typical result is expected to be that all but a few constituent PNodes will receive the same percentage of CRR awards relative to the disaggregated nomination. To the extent that a few of the constituent PNodes are awarded at a higher percentage than the rest, the ISO's proposal gives the benefit to the award of the Trading Hub CRR.

[5] The ISO currently envisions performing this step as post-processing, between running of the SFT and publication of CRR awards, in order to facilitate its software implementation within a reasonable timeframe. A nuance of modeling is that some small CRRs that would be rebundled back to Trading Hub CRRs will still be lost due to truncation of the SFT results, e.g., down to 0.001 MW. The ISO would be unable to track counterflow CRRs below such a level. Thus, in the proposed post-processing, the ISO will apply truncation to the disaggregated nominations like it is applied to the awards, and then calculate the counterflow CRRs as the difference between the truncated nomination (after adjusting the nomination by the highest percentage of any CRR that is awarded by the SFT) and the truncated award. The ISO will discuss examples of this calculation step during the November 16 stakeholder conference call.

[6] This presentation for the ISO's Straw Proposal is available at http://www.caiso.com/2464/2464c5941a230.pdf. If further discussion of these examples is needed during the December 18 conference call, please contact the ISO at jprice@caiso.com.

checks and verifications to avoid potential use of incorrect Trading Hub weighting factors. During the September 8 stakeholder meeting, the ISO described the review process whereby a separate ISO group, external to the CRR team, validates the process by which the Trading Hub weights are calculated. SVP notes that the ISO's proposal does not simplify the computational process within the CAISO software. Indeed, the purpose of this proposal is not to simplify the computational process, but rather to reduce the data management burden of both the ISO and market participants now have due to the numerous small CRRs that the current process creates.

PG&E and Powerex do not object to the ISO's proposal.

However, Powerex has concerns that the Trading Hub CRRs can be eligible for renewal in the PNP separate from the counterflow CRRs, since there is no requirement to continue to hold counterflow CRRs that enabled the Trading Hub CRRs, and SVP opposes the eligibility of Trading Hub CRRs for similar reasons. SVP suggests that if Trading Hub CRRs are allowed in the PNP, then at a minimum, the corresponding counterflow CRRs must also be part of the renewal to at least partially preserve the similarity between the Trading Hub CRRs within the seasonal allocation process. In particular, SVP is concerned that if the Trading Hub CRRs are allowed to be nominated in Tier LT, over time the mix of counterflow CRRs from the initial nomination may no longer be sufficient to preserve the feasibility of the Trading Hub CRRs. SDG&E asks for clarification of the rules for renewal of Trading Hub and counterflow CRRs. Perhaps the ISO's Straw Proposal did not anticipate aspects of the renewal of Trading Hub CRRs that these questions concern. The ISO's intent is that (a) a nomination to renew a previously allocated Trading Hub CRR in the PNP does not have priority over other CRR nominations in the PNP, (b) the renewed Trading Hub CRR is for seasons of the year that is the subject of the annual CRR process (not for a Trading Hub with the previous year's composition), and (c) the nomination of the renewal of a Trading Hub CRR must go through the same SFT processing, including award of counterflow CRRs, that applied to the previously allocated Trading Hub CRR. The nomination of a Trading Hub CRR must go through the same four-step process that is described above for any other tier in the CRR allocation. The PNP processing will use the new year's network model (including allocation factors), will only be awarded to the extent that its sink remains unconstrained within the limits used in the PNP, and new counterflow CRRs will be awarded as needed to make the Trading Hub CRR feasible for the new year's conditions. The ISO believes that these details of this proposal resolve the concerns expressed by Powerex and SVP, and answer SDG&E's request for information.

### 4.2.3. Elimination of multi-point CRRs

The current CRR process allows for multi-point CRRs, i.e., CRRs that can be defined by multiple sources or multiple sinks or both (current rules vary between the allocation and auction). Multi-point CRRs were originally proposed early in the design of the CRR release process, before the stakeholders and the ISO agreed on the tiered structure of the CRR allocation process that was eventually filed and approved by FERC. The last point is important to illustrate the reason why multi-point CRRs were created, namely, to enable participants in the CRR allocation process to assign different priorities to the CRRs they nominate so that the simultaneous feasibility test (SFT) would reduce lower priority nominations first when reductions are needed to achieve simultaneous feasibility. The ability to designate priorities was important in the context of the single-step process for allocating CRRs that was under consideration at that time. With the adoption of the three-tier annual allocation process, however, the tier structure now provides the opportunity for parties to designate their priorities through their

choice of which CRRs to nominate in each tier. Thus the primary motive for having multi-point CRRs no longer exists, and the ISO is now considering that they should be eliminated from the CRR design.

In addition to the argument above, there is another reason for eliminating multi-point CRRs. The ISO has previously committed to providing a "sell function" in the CRR auction system, whereby a CRR holder can offer a previously-acquired CRR for sale in the auction and can thereby eliminate from its CRR holdings as many MW of that CRR as are sold in the auction (see the next section for a full discussion of the sell function). The ISO has determined, through discussions with its vendor, that in order to move forward expeditiously to implement the CRR sell function it will be much more complex and costly to implement this functionality if the CRR system must continue to support multi-point CRRs. The complexity and cost of having this functionality impacts almost every aspect of the CRR software.

Finally, multi-point CRRs have had extremely limited use since the start of the CRR market, and the ISO therefore believes that it would not impose any detriment to the market to eliminate this feature. To provide some context for how often the multi-point CRR alternative was selected, for the 2009 annual CRR Allocation and CRR Auction we had a total of just over ½ of 1% (.007) of the total CRRs released as multi-point CRR. For all these reasons, the ISO now believes there is reason to eliminate multi-point CRRs.

Based on comments received, it appears that stakeholders were concerned that eliminating multi-point CRRs as well as eliminating tier 2 of the monthly CRR Allocation would not be beneficial so the ISO has determined that the best course of action would be to retain both tiers of the monthly CRR Allocation, along with some modified nomination rules, and eliminate the multi-point CRR. The modified nomination rules that are being proposed will be discussed in section 4.2.5 below. Removal of the multi-point CRR will improve the ease with which the ISO can implement other features requested by participants, such as the auction sell feature and Weighted Least Squares (WLS).

All submitted comments, with the exception of Powerex, supported the removal of the multi-point CRR function as long as the monthly allocation process retained both tiers along with the proposed modifications to the monthly allocation rules. The ISO understands the comment by Powerex but believes that based on the comments received and the benefits of ease and lower cost of implementing the auction sell feature, which Powerex supports, and other enhancements provides incentive to remove the multi-point function.

### 4.2.4. Weighted least squares objective function in the SFT

There are two basic objective function formulations that can be utilized for allocating CRRs:

- Maximizing CRR MW (Max CRR)
- Weighted Least Squares (WLS).

The ISO's CRR allocation process currently utilizes the Max CRR formulation. The ISO's Issue Paper considered moving to a WLS formulation because, when a constraint becomes binding in the simultaneous feasibility test (SFT) for the allocation and some CRR nominations must be curtailed, the Max CRR formulation will minimize the quantity of curtailed nominations, which will tend to impose most if not all of the curtailment on a single allocation participant. Under this formulation the nomination that is most effective in relieving the constraint will be curtailed completely before going to the next most effective nomination. In contrast, the WLS would distribute the curtailment across all CRR nominations that are effective in relieving the

congestion, and thus would spread the curtailment among multiple allocation participants. The WLS may be a more equitable formulation for the CRR allocation process.[7]

At the time of publishing the Straw Proposal, the ISO was concerned that implementing the WLS objective function may be a significant change to the existing CRR software, and that it consider whether the benefits of implementing this change would be sufficient to justify its cost. The ISO also observed that its Market Initiatives Roadmap identifies a number of changes in the CRR auction processes that may occur in upcoming years, including but not limited to a conversion from CRRs to Auction Revenue Rights, which could limit the time for which the enhanced software would be used. Comments on the Straw Proposal support for implementing the WLS objective function. The outcome of prioritizing changes in the CRR auction processes during 2010, and time requirements for such changes, are not known yet. Therefore, the ISO proposes to proceed with implementing the WLS objective function.

Details of the optimization issues are repeated below to facilitate further discussion, but are unchanged from the Straw Proposal.

#### 4.2.4.1. Optimization Formulations

Let $X_i$ represent the MW value of a Point-to-Point CRR. We let $\overline{X}_i$ represent the nominated value. In both the Max CRR and WLS formulations, $X_i$, represents the control variable. We assume there are $N$ control variables. The Max CRR and the WLS optimization formulations are shown in Table 1 below. Note that only Point-to-Point nominations are considered for simplicity.

[7] This problem is relevant to the allocation process only, not to the CRR auction. In a CRR auction the auction participants use their bid prices to convey their value on each CRR, and the auction objective is to maximize the financial surplus resulting from clearing the auction. As a result, when there is a congested constraint the SFT will curtail CRR bids based on the participants' bid prices so as to minimize the reduction in the financial surplus. In an allocation process there are no economic bids, so all nominated CRRs are identical from a financial perspective.

**Table 1. Max CRR and the WLS formulations**

| Formulation Part | Maximizing CRR MW | Weighted Least Squares Mathematical Equation | Terminology/Notes |
|---|---|---|---|
| Objective function | $\max\left(\sum_{i=1}^{N}\alpha_i \cdot X_i\right)$ | $\min\left(\sum_{i=1}^{N}\alpha_i\left(\overline{X}_i - X_i\right)^2\right)$ | $\alpha_i$ are proxy weighting factors with $\alpha_i \geq 0$ |
| Flow Constraints for each constraint, *l* | $\sum_{i=1}^{N} X_i \cdot SF_{i,l} \leq OTC_l$ | | $SF_{i,l}$ is the shift factor (calculated from the Full Network Model) for the $i^{th}$ control variable on the $l^{th}$ constraint. $OTC_l$ is the limit for the $l^{th}$ constraint. |
| Control Variable upper and lower bound constraints for each variable, $X_i$ | $0 \leq X_i \leq \overline{X}_i$ | | |

## 4.2.4.2. Analysis of the Max CRR Objective Function

For a simple situation of one overloaded constraint (due to the application of the nominations at the nomination MW value to the Full Network Model), the control variable that has the largest positive shift factor on the overloaded constraint will be reduced exclusively to alleviate the constraint. This means that this control variable could be set to zero MW and if the constraint is still overloaded, the optimization formulation will then look at the next highest shift factor to adjust. Thus, the CRRs that are the most effective (have the highest shift factor) in alleviating a constraint are adjusted first.

The reason that the most effective CRR nominations are adjusted first is that this reduces the total amount of CRR MW the least. The objective function is to maximize the CRR MW and the adjusting the most effective CRRs maximizes the CRR MW.

***Max CRR Example***

Assume to CRR nominations that create an overload on an enforced constraint (constraint *k*). Assume the overload to be 5 MW. Assume the $\alpha_i$ are unity. Assume nomination #1 to be 100 MW and the nomination #2 to be 50 MW. Assume $SF_{1,k}$ = 0.5 and $SF_{2,k}$ = 0.2. In this case, the control variable #1 (has the shift factor $SF_{1,k}$) will be used exclusively to alleviate the constraint overload since ($SF_{1,k}$ = 0.5) > ($SF_{2,k}$ = 0.2). In this case, control variable #1 is reduced by overload/ $SF_{1,k}$ = 5/0.5 = 10 MW. In this case, the CRR MW cleared is 100 – 10 + 50 = 140 MW.

If control variable #2 was used to alleviate the constraint, the reduction to control variable #2 would be overload/ $SF_{1,k}$ = 5/0.2 = 25 MW. In this case, the CRR MW cleared is 100 + 50 - 25

= 125 MW, which is less than the total cleared using control variable #1. Thus, adjusting control variable #1 maximizes the CRR MW.

Note that any combination of adjusting both control variables #1 and #2 will result in a cleared MW amount that is less than 140 MW.

In situations where the two shift factors are very close to each other, e.g., $SF_{1,k}$ = 0.50 and $SF_{2,k}$ = 0.49, the control variable with the slightly larger shift factor will be reduced first. This is an unattractive feature of the Max CRR objective function.

### 4.2.4.3. Analysis of the WLS Objective Function

Assume the $\alpha_i$ are unity. Based on the nominated amounts, assume an overload on $k^{th}$ constraint with the overload equal to $\Delta V_k$. Assume, in fact, the $k^{th}$ constraint is the only enforced constraint in this formulation. $\Delta V_k = \sum_{i=1}^{N} \overline{X}_i \cdot SF_{i,k} - OTC_k$. Thus, the control variables must be reduced. Let $\Delta X_i = \overline{X}_i - X_i$ and $\Delta V_{k,i} = \Delta X_i \cdot SF_{i,k}$. $\Delta V_{k,i}$ is the reduction of the flow on the $k^{th}$ constraint due to the reduction in the $i^{th}$ control variable, $\Delta X_i$. Assume that all shift factors are positive with respect to the constraint overload. The solution of least squares optimization problem provides the following relationships.

The reduction of the overload is attributed to each control variable, $\Delta V_{k,i}$, as follows:

$$\Delta V_{k,i} = R_{i,k} \cdot \Delta V_k$$

$$R_{i,k} = \frac{SF_{i,k}^{\ 2}}{\sum_{j=1}^{N} SF_{j,k}^{\ 2}}; \sum_{i=1}^{N} R_{i,k} = 1$$

The reduction of the each control variable is as follows:

$$\Delta V_{k,i} = SF_{i,k} \cdot \Delta X_i$$

$$\Delta X_i = \frac{1}{SF_{i,k}} \cdot \Delta V_{k,i} \Rightarrow \Delta X_i = \frac{1}{SF_{i,k}} \cdot \frac{SF_{i,k}^{\ 2}}{\sum_{j=1}^{N} SF_{j,k}^{\ 2}} \Delta V_k$$

$$\Delta X_i = \frac{SF_{i,k}}{\sum_{j=1}^{N} SF_{j,k}^{\ 2}} \Delta V_k$$

***WLS Example***

Assume a problem with just two control variables. The above equations become.

$$\Delta V_{k,1} = R_{1,k} \cdot \Delta V_k; \Delta V_{k,2} = R_{2,k} \cdot \Delta V_k$$

$$R_{1,k} = \frac{SF_{1,k}{}^2}{\left(SF_{2,k}{}^2 + SF_{1,k}{}^2\right)}; R_{2,k} = \frac{SF_{2,k}{}^2}{\left(SF_{2,k}{}^2 + SF_{1,k}{}^2\right)}$$

$$\Delta X_1 = \frac{1}{SF_{1,k}} \cdot \Delta V_{k,1} \Rightarrow \Delta X_1 = \frac{SF_{1,k}}{\left(SF_{2,k}{}^2 + SF_{1,k}{}^2\right)} \Delta V_k$$

$$\Delta X_2 = \frac{1}{SF_{2,k}} \cdot \Delta V_{k,2} \Rightarrow \Delta X_2 = \frac{SF_{2,k}}{\left(SF_{2,k}{}^2 + SF_{1,k}{}^2\right)} \Delta V_k$$

Let

$SF_{1,k}$ = 0.5; $SF_{2,k}$ = 0.2; $\Delta V$ = 10 MW, i.e., the overload is 10 MW. Let the nominated amount for control variable #1 be 100 MW and for control variable #2 be 50 MW.

$$R_{1,k} = \frac{0.5^2}{0.5^2 + 0.2^2} = \frac{0.25}{0.25 + 0.04} = \frac{0.25}{0.29}$$

$$R_{2,k} = \frac{0.2^2}{0.5^2 + 0.2^2} = \frac{0.04}{0.25 + 0.04} = \frac{0.04}{0.29}$$

Note that $R_{1,k} + R_{2,k} = 1$

$$\Delta V_{k,1} = \frac{0.25}{0.29} \cdot 10;\ \Delta V_{k,2} = \frac{0.04}{0.29} \cdot 10$$

$$\Delta X_1 = \frac{0.5}{0.29} \cdot 10;\ \Delta X_2 = \frac{0.2}{0.29} \cdot 10$$

**Table 2 Summary of the WLS example**

| ***Control Variable #*** | $SF_{i,k}$ | $\Delta V_{k,i}$ | $\Delta X_i$ |
|---|---|---|---|
| 1 | 0.5 | $\frac{0.25}{0.29} \cdot 10$ = 8.62 | $\frac{0.5}{0.29} \cdot 10$ = 17.24 |
| 2 | 0.2 | $\frac{0.04}{0.29} \cdot 10$ = 1.38 | $\frac{0.2}{0.29} \cdot 10$ = 6.90 |
| Total Flow Reduction of Overload | | 10 | |

In the WLS formulation, the reduction on the flow on the constraint is pro-rated based on squares of the shift factors. Both the numerator and denominator are composed of shift factors squared.

The reduction in the actual control is pro-rated based on shift factor (not squared). The higher the shift factor value relative to others the more the control will be adjusted. Thus there is a ***sharing*** of reduction as compared to the Max CRR method in which the most effective control variable is reduced first.

### 4.2.4.4. Example with Results from WLS and Max CRR

If the example above was optimized using Max CRR (this is the optimization currently employed in the allocation process), $X_1$ will be reduced by 20 = 10/0.5, where 0.5 is the shift factor for $X_1$. This control variable has a larger shift factor than the other and this is why it is adjusted first to alleviate the constraint. If the second control variable was used, it would be reduced by 10/0.2 = 50. Table 3 below provides a comparison of the WLS and the Max CRR methodologies using the above example.

Table 4 provides another example where the shift factors are very close to each other. The shift factor for control variable 2 is changed from 0.2 to 0.49. Using the same binding constraint as in Table 3, the unconstrained flow on the constraint that was enforced in Table 3 would be the sum of (shift factor * nominated amount) for the two CRRs, which is (0.5 * 100 MW) + (0.2 * 50 MW) = 60 MW. After the reduction of 10 MW, the enforced limit is 50 MW. Using a shift factor of 0.49 instead of 0.2 for the second CRR, the unconstrained flow is (0.5 * 100 MW) + (0.49 * 50 MW) = 74.5 MW, and the required reduction is 24.5 MW. Because of the similar shift factors, the reduction in awards is distributed by similar amounts between the two CRRs, in contrast with the current Max CRR method that reduces only the most effective CRR.

Table 3 Example with WLS and Max CRR

| | | | ***WLS Method*** | | | ***Max CRR Method*** | | |
|---|---|---|---|---|---|---|---|---|
| ***Control Variable*** | $SF_{i,k}$ | ***Nominated Amount*** | $\Delta V_{k,i}$ | $\Delta X_i$ | ***Cleared Amount*** | $\Delta V_{k,i}$ | $\Delta X_i$ | ***Cleared Amount*** |
| 1 | 0.5 | 100 | (0.25/0.29) 10 = 8.62 | (0.5/0.29) 10 = 17.24 | 82.76 | 10 | 20 | 80 |
| 2 | 0.2 | 50 | (0.04/0.29) 10 =1.38 | (0.2/0.29) 10 = 6.90 | 43.10 | 0 | 0 | 50 |
| Totals | | 150 | 10 | 24.14 | 125.86 | 10 | 20 | 130 |

Table 4 Example with WLS and Max CRR with Shift Factors Closer Together in Value

| | | | ***WLS Method*** | | | ***Max CRR Method*** | | |
|---|---|---|---|---|---|---|---|---|
| ***Control Variable*** | $SF_{i,k}$ | ***Nominated Amount*** | $\Delta V_{k,i}$ | $\Delta X_i$ | ***Cleared Amount*** | $\Delta V_{k,i}$ | $\Delta X_i$ | ***Cleared Amount*** |
| 1 | 0.5 | 100 | (0.25/0.4901) 24.5 = 12.497 | (0.5/0.4901) 24.5 = 24.995 | 75.005 | 24.5 | 49 | 51 |
| 2 | 0.49 | 50 | (0.2401/0.4901) 24.5 = 12.003 | (0.49/0.4901) 24.5 = 24.495 | 25.505 | 0 | 0 | 50 |
| Totals | | 150 | 24.5 | 49.490 | 100.510 | 24.5 | 49 | 101 |

Under both methods the overload is removed. However, in the WLS method, the control variables share in the reduction, whereas in the Max CRR method the control variable with the larger shift is reduced to alleviate the constraint. A very important result is that under both cases, 10 MW of overload was removed from the constraint. The amount of removal does not change with the change in the method. The real difference is in which control variables are used and in what amounts to remove the overload.

The results in Table 4 show a much more equal sharing in the reduction for the WLS as opposed to the Max CRR.

Also, if the shift factors were equal, the Max CRR method would pro-rate the reductions based on the nominated amount. This is not explicitly shown in the optimization formulation. In fact, since the Max CRR formulation is a linear program, equal shift factor would result in a degenerate solution case in which there is not a unique solution (an infinite number of combinations for reductions in control variable #1 and #2 would work). However, the pro-rationing is properly handled in the software.

In the WLS, if the shift factors were equal we see the reduction would be equally shared between the two control variables even though the nominated amount for control variable #1 is twice as large as the nominated amount for control variable #2. The WLS formulation can more appropriately manage the proper pro-rationing by determining the proxy weights based on the nominated amounts. However, this part of the formulation is not illustrated in these examples. The final weights will be established in Business Practice Manuals.

SDG&E is very much in favor of implementing the WLS objective function as soon as possible, since it results in the equitable outcome for relieving constraints in the SFT by distributing the reductions across all nominations. SDG&E recommends that WLS implementation should not be held back as other enhancements like ARRs are considered, since WLS is beneficial in an ARR environment as well. SDG&E requests implementation at the same time as the proposal to award Trading Hub CRRs, since each process needs to integrate with the overall SFT. Powerex supports this enhancement only to the extent it does not compromise any future enhancements to the CRR process, for example, converting from a CRR to an ARR model like certain other ISO's. PG&E does not object to CAISO's proposal but requests simulations of actual nominations evaluated with the WLS objective function, suggesting that private results could be communicated to each market participant to evaluate how it would have fared with a WLS objective function.[8]

SCE supports the ISO proposal to further evaluate the costs and benefits of implementing a WLS objective function, and suggests this issue should be evaluated further in next year's Market Initiative Roadmap process. SVP is concerned that the WLS approach may favor the larger market participants at the expense of the smaller ones.

As the ISO has begun to examine alternatives for implementing ARRs and other CRR auction enhancements, it recognizes the possibility stated in some stakeholder comments that WLS may be beneficial in either an ARR or CRR environment. WLS implementation, like the other topics in this Draft Final Proposal, are near term enhancements, whose staging will need to be determined in the implementation phase but may be close together in their timing. In contrast, ARRs and other auction enhancements are long-term enhancements that will require an

[8] PG&E also asks how the ISO will determine whether the benefits of implementing WLS exceed its costs. Since the ISO has concluded that there is sufficient stakeholder support to proceed with WLS implementation, such analyses would now be moot.

extensive stakeholder process, after prioritization through the Market Initiative Roadmap process. Thus, at this time, stakeholder comments show sufficient support to proceed with WLS implementation, and the ISO does not see WLS implementation as significantly affecting the timing of converting from a CRR model to an ARR model.

Regarding simulations using actual nominations, the historical nominations by market participants reflect expected historic conditions, and do not necessarily reflect future years' conditions. In addition, the ISO believes that its evaluations of proposals should reflect sound market design principles, rather than incremental changes in market outcomes that would cause market participants to prefer one outcome to another. The comparisons provided by the ISO demonstrate that the WLS formulation produces more equitable market outcomes among market participants to relieve congestion, rather than imposing most if not all of curtailments on single market participants (whether large or small).

### 4.2.5. Refinement of tiers in monthly allocation

Based on comments that have been received from various CRR participants the CAISO understands that the current monthly CRR process can take a considerable amount of time and resources for entities to participate in the allocation and auction processes. Through the stakeholder comments that were received the ISO has determined that since there was no support for completely removing a tier from the allocation process that it might be possible to improve the monthly allocation process by refining some of the rules. A couple of proposed rule changes would include:

- Allow sub-LAPs to be nominated in tier 1 of the monthly allocation since the Default LAPs are often limited in tier 1.
- Allow LSEs to nominate 100% of the difference between the Monthly CRR Eligible Quantity (MEQ) and any previously allocated CRRs for tier 1 and have tier 2 be available to fill in where nominations were not adequately covered in tier 1.

Comments all generally support the above proposal with a couple of additional comments. SDG&E supports the proposal as long as it is in conjunction with implementing WLS, which is part of this proposal. SVP suggests also allowing sub-LAPs to be used in tier 2 of the annual allocation process, which we can consider as part of this proposal. PG&E supports the proposal but notes that the proposal does not provide for any improvement in the timeline provided for the review of the monthly CRR FNM. PG&E's suggestion is to take a new look at the 30-day outage rule to determine if there is a way to gain additional time by extending when the PTOs submit outage data to the ISO. This will get added to the list of CRR policy topics for future consideration.

## 4.3. Non-Credit Business Process Issues

### 4.3.1. Sale of CRRs in the CRR auction

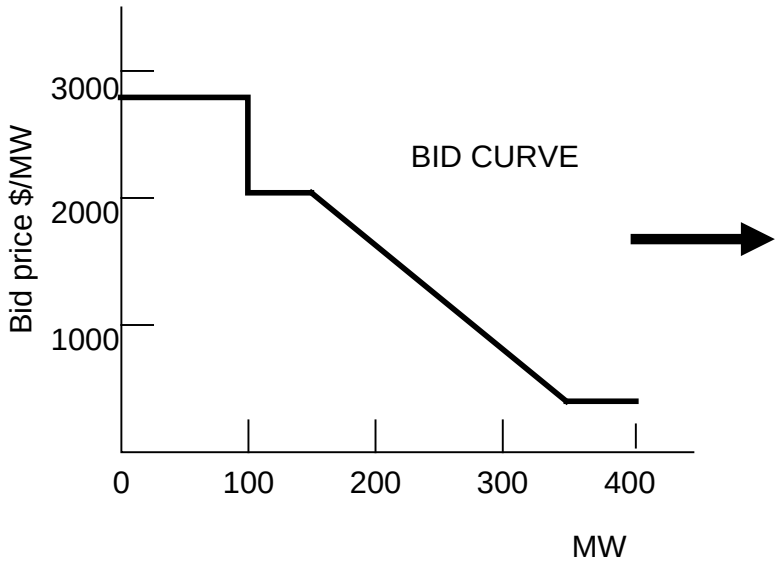
Currently a CRR holder that wants to liquidate a CRR holding can sell it in the auction by purchasing an opposite and offsetting CRR in the auction and, if successful, continue to hold both the original CRR and its opposite or try to sell it through the Secondary Registration System (SRS). Stakeholder comments submitted have supported moving forward with the auction sell feature with additional information being requested by participants. Listed below is

some additional information on how the ISO would envision implementing this feature. The ISO would appreciate any comments on the topics listed below or any additional items.

- The CAISO would allow the sale of CRRs acquired through either the auction or allocation but allocation CRRs would need to take on the "Financial CRRs" that would be required through the current SRS
- If a CRR Holder were selling into the auction at a negative value, meaning the CRR Holder would be paying to sell the CRR, then there would need to be collateral requirements established to ensure that this payment could be made.
- The bid curves are slightly different for the buy and sell. The bid curve of a sell offer must start from zero MW and must be monotonically increasing. The maximum MW amount in a bid curve of a sell offer must be less than or equal to the available MW of the fixed PTP CRR.

**Buy Bid Curve**

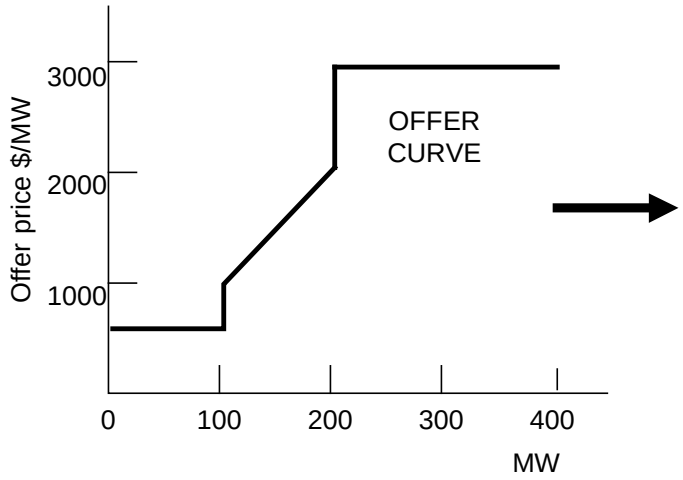
The buy bid price specifies the maximum price the MP is willing to pay for the CRR. If the clearing price is less than the bid price, the MP will be awarded all MWs that he bid for. If the clearing price is equal to the bid price, a partial MW amount will be awarded.




| MW | Price |
|---|---|
| 0 | 2800 |
| 100 | 2800 |
| 100 | 2000 |
| 150 | 2000 |
| 350 | 400 |
| 400 | 400 |

### Sell Offer Curve

The sell offer specifies the minimum price the MP wants for the CRR being sold. If the clearing price is greater than the offer price, the MP will sell all MWs that have been put up for sale. If the clearing price is equal to the offer price, the MP will sell a partial MW amount.




| MW | Price |
|---|---|
| 0 | 600 |
| 100 | 600 |
| 100 | 1000 |
| 200 | 2000 |
| 200 | 3000 |
| 400 | 3000 |

- The CRRs being offered for sale must be for the same term and equal to or less than the MW amount of the CRRs held.
- The CRR sell function would be performed through the current Auction Portfolio Editor available in the existing CRR MUI

All comments submitted support the implementation of the sell feature with a request for a couple of clarifications. SVP was concerned that the ISO would eliminate the ability to acquire counter-flow CRRs to CRRs acquired either through the allocation or prior annual auction period. The ISO is not proposing to eliminate the ability to do this and entities will still be allowed to obtain CRRs for the same period in both directions if that is how they would like to offset their CRR portfolio. SDG&E also asked for clarification on the concept of "Financial CRRs" as mentioned above. The concept of Financial CRRs was implemented in a previous CRR enhancement to account for the trading, through the SRS, of CRRs acquired through the allocation and is described in Attachment H of the BPM for CRRs. The general concept is similar to that of Load Migration in that allocated CRRs are awarded based on the load being served by the LSE and should load move the CRRs related to that load should also move. In the case of selling allocated CRRs into the auction the ISO proposes that this be allowed, just like allocated CRRs can be transferred the Secondary Registration System (SRS), but that the selling LSE be required to maintain sufficient "Financial CRRs" to offset the possibility that the CRRs being sold might eventually be subject to Load Migration.

### 4.3.2. Modeling approaches to reinforce CRR revenue adequacy through transmission outages consideration

CRRs were revenue inadequate in the ISO markets for the months of April and May 2009, leading the ISO to further consider its modeling approaches to reinforce CRR revenue adequacy in light of transmission outages. A notable characteristic of these months is that they are the time for completion of transmission maintenance work before the summer season begins. Since then, the ISO has limited the quantity of CRRs that are released in the monthly CRR process, and the revenue inadequacy has been less of a concern that it was in these initial months. However, the CRR revenue adequacy has remained variable during the subsequent months and has been uncertain during the summer when critical forced outages have occurred, and there has not been a great level of comfort that any particular month would end in revenue adequacy. The concern for revenue adequacy continues to be present as transmission maintenance activity has resumed in the fall, and as winter storms cause outages.

The ISO therefore intends to review and possibly reconsider the factors that determine the quantity of CRRs it releases to determine whether any changes are needed, in particular to the amount of network capacity that is made available for CRRs. The ISO will be considering, among other things, (1) what improvements can be made to the modeling of outages in the monthly CRR model and (2) possible reduction of the 75% capacity availability level in the annual CRR process. As stated in the Issue Paper, this is a topic that may take some time to resolve, because the ISO believes that at least 12 months of operational experience in the new market structure will be necessary before the ISO can establish more than interim values for the amount of CRRs to release in the monthly CRR process. Then, the ISO will examine this issue further.

All comments received were supportive of postponing discussion of this topic until the ISO has further data on which to base the discussions. Comments recognized the importance of this topic and the possible impacts on the CRR allocation and auction processes.

### 4.3.3. Tracking of Long Term CRRs in the CRR system

As per Tariff requirements, section 36.8.5, load migration is also reflected in Long-Term CRRs. LT CRRs have a life spanning nine years. Currently, due to system limitations LT CRRs are defined within the CRR system for a rolling two-year life. For instance, for LT 2009-2018 the CRR system has only records of CRRs for 2009 and 2010. By the start of next year, CRRs for 2009 will expire and then records for CRR 2011 will be created, and so on, until reaching 2018. Due to this shortcoming, CRR transfers to reflect load migration are only reflected on the currently existing two-year span of LT CRRs. With the current configuration, when reaching the start of a new year, LT CRRs will have their life extended one more year, but these newly created CRRs will not have reflected any load migration that have already affected LT CRRs up to that point on time. In this case, load migration is only reflected in the current two-year life of the CRRs. For this reason, an enhancement of the CRR system is needed to keep track of LT CRRs and systematically reflect load migration on them for their whole life span.

The Issue Paper stated the ISO's assessment is that the proposed change affects only the internal processing of CRRs and remains within the established tariff and policy. No stakeholder comments have differed with the ISO's assessment regarding this process improvement, and thus the ISO will proceed to make this refinement in its processes. When this new function has been implemented the ISO will notify CRR participants. The only change that

CRR Holders will see is that instead of only seeing two years of Long Term CRRs through the CRR system, they will be able to see all applicable years of the Long Term CRRs.

There were no concerns with this administrative improvement so the ISO will pursue implementation of this process.

### 4.3.4. Clarification of process for submission of PNP "signature data"

During preparation for the PNP for the 2010 annual CRR process the ISO had issued a technical bulletin to provide clarification of the process for developing "signature data" for the Priority Nomination Process (PNP). The process that was followed is in line with the current Tariff language but some participants felt that additional language should be added to better describe how this process should be done. The ISO will include suggested Tariff language for this issue when any necessary Tariff language is submitted for the other topics addressed in this document.

All comments supported preparation of Tariff language to clearly define the PNP and the associated data on which the PNP "signature data" set will be prepared.